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Leason Ellis LLP One Barker Avenue Fifth Floor White Plains, NY 10601-1526			PILKINGTON, JAMES	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,739	Applicant(s) MARUYAMA ET AL.
	Examiner JAMES PILKINGTON	Art Unit 3656

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 11 July 2011.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
- 4) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) Claim(s) 1,3 and 7-20 is/are pending in the application.
- 5a) Of the above claim(s) 7-9 is/are withdrawn from consideration.
- 6) Claim(s) _____ is/are allowed.
- 7) Claim(s) 1,3 and 10-20 is/are rejected.
- 8) Claim(s) _____ is/are objected to.
- 9) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 10) The specification is objected to by the Examiner.
- 11) The drawing(s) filed on 29 September 2005 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 6/2/11
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date, _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 11, 2011 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3 and 10-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the sintered density" in line 11. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitation "the sintered density" in line 14. There is insufficient antecedent basis for this limitation in the claim.

Claim 11 recites the limitation "the sintered density" in line 12. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 recites an angle between "adjacent parts" of the enlarged diameter parts. However there is not a previous requirement in the claim for the enlarged

diameter parts being adjacent. Claim 16 ultimately depends from claim 1 which requires only one enlarged diameter part at each end, since there is only one at each end these enlarged parts are not adjacent. Should claim 16 depend from 15 and define that each step change is an additional "enlarged diameter part"?

Claim 17 recites the limitations "the line obliquely" in line 2 and "the first parts" in line 3. There is insufficient antecedent basis for these limitations in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 10, 14-16, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris, USP 3,445,148, in view of Tanaka, US PGPub 2002/0001420.

Regarding claims 1, 3 and 15, Harris discloses an oil-impregnated sintered bearing comprising: a bearing body (blank 50, finished product 52) made of a sintered metal (see column 4 lines 24-28) to support a rotating shaft by an inner surface thereof as a friction surface (column 5 lines 45-59 discloses that a shaft is supported by the bearing), said bearing body (52) having a bearing hole (central opening) therein; wherein the bearing hole includes a journal part (52b) that has a constant diameter, said journal part being configured to support the rotating shaft when the shaft is parallel to an axial direction of the bearing body, and enlarged diameter parts (at 52a) that are

respectively provided on both sides of the journal part (see Figure 3B) in the axial direction of the bearing body so as to be connected with the journal part; the sintered density of the enlarged diameter parts (52a) is larger than that of the journal part such that cavities (pores) exposed on an inner surface of the enlarged diameter part are smaller in size and fewer in number (52a is disclosed as having greater density and lower permeability, see column 5 lines 23-44, smaller and fewer pores results in a greater density and lower permeability) than those cavities exposed on an inner surface of the journal part (52b is disclosed as having a lower density and greater permeability, see column 5 lines 23-44, larger and a greater number of pores results in a lower density and greater permeability), each of the enlarged diameter parts includes a first part connected with an end of the journal part (tapered face is first part)[claim 1]; wherein each of the enlarged diameter parts has a taper angle with respect to the longitudinal direction of the enlarged diameter part which is provided on one side of the journal part and a taper angle with respect to the axial direction of the other enlarged diameter part, and, the journal part and first parts respectively support the shaft; and a taper angle between the first parts and the axial direction of the bearing body are equal to each other (each side of 52 in Figure 3b has a taper). It is also noted that Harris discloses the same pressing steps used to form the bearing as in the instant application including coining/pressing the ends of the blank , see column 5 lines 23-44, since Harris uses the same/similar method the resulting structure will have the ends of the bearing having a smaller pore size and fewer pores.

Harris does not disclose that said enlarged diameter parts are configured to support the rotating shaft when the shaft inclines with respect to the axial direction of the bearing body; a line obliquely extending along an inclined surface of one of the first parts is arranged parallel to a line obliquely extending along an inclined surface of the other first part, and a distance between the lines is substantially equal to the diameter of the rotating shaft [claim 1]; a shortest distance between the line obliquely extending along an inclined surface of one of the first parts and the journal part across a middle axis of the bearing body is substantially equal to the diameter of the rotating shaft [claim 3]; the enlarged diameter parts has taper angles which change stepwise with respect to a longitudinal direction of the enlarged diameter part such that the taper angle increases with increasing distance from the journal part [claim 15].

Tanaka teaches a bearing having a journal part (32) and enlarged diameter parts (33), wherein the enlarged diameter parts are configured to support the rotating shaft when the shaft inclines with respect to the axial direction of the bearing body (see column 4, lines 44-48), a line obliquely extending along an inclined surface of a first part (first taper from the main journal part 32) is arranged parallel to a line obliquely extending along an inclined surface of another first part on the other side of the journal part, and a distance between the lines is substantially equal to the diameter of the rotating shaft (paragraphs 0040-0042, surfaces 33 are sized to support the shaft even when inclined); and wherein a shortest distance between a line obliquely extending along an inclined surface of one of the first parts (33) and the journal part facing across a middle axis of the bearing body is substantially equal to the diameter of the rotation

shaft (the distance between an oblique line from surface 33 to the center of the journal surface 32 on the opposite side of the bearing is substantially equal to the diameter of the rotating shaft so that the shaft can shift within the bearing, see Figures 10 and 12), the enlarged diameter parts has taper angles which change stepwise (first surface 33 and additional taper at the openings, see Figure 10) with respect to a longitudinal direction of the enlarged diameter parts such that the taper angle increase with increasing distance from the journal part on each end of the journal parts, for the purpose of sizing the enlarged diameters of the bearing so that they can support the shaft when the shaft is inclined relative to the axis of the bearing to increase the lifetime of the bearing (column 4 lines 37-48).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Harris and provide each of said enlarged diameter parts to be configured to support the rotating shaft when the shaft inclines with respect to the axial direction of the bearing body; a line obliquely extending along an inclined surface of one of the first parts is arranged parallel to a line obliquely extending along an inclined surface of the other first part, and a distance between the lines is substantially equal to the diameter of the rotating shaft [claim 1]; a shortest distance between the line obliquely extending along an inclined surface of one of the first parts and the journal part across a middle axis of the bearing body is substantially equal to the diameter of the rotating shaft [claim 3]; the enlarged diameter parts has taper angles which change stepwise with respect to a longitudinal direction of the enlarged diameter part such that the taper angle increases with increasing distance from the journal part [claim 15], as

taught by Tanaka, for the purpose of providing a bearing that can support a shaft when the shaft is inclined relative to the axis of the bearing to increase the lifetime of the bearing.

Regarding claim 14, Harris also does not disclose that the taper angles with respect to the longitudinal direction of the first parts of the enlarged diameter parts are 3° or less with respect to the journal portion.

Since the applicant is silent to any criticality or unexpected results from having the angle set at 3 degrees or less it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Harris and provide an angle of 3 degrees or less since the device of would perform perfectly well with any acute angle, the particular angle of 3 degrees is a matter of design choice. The amount of the angle provides the predictable result of limiting of movement within the shaft and one of ordinary skill in the art would design the bearing with the appropriate angle to limit the range of movement based on the application of the bearing.

Regarding claim 16, Harris in view of Tanaka does not disclose that the difference between the taper angles of adjacent parts of each of the enlarged diameter parts is 3° or less.

Since the applicant is silent to any criticality or unexpected results from having the difference in taper angles between adjacent section set at 3 degrees or less it would have been obvious to one having ordinary skill in the art at the time of the invention to

modify the teachings of Harris and provide an angle difference of 3 degrees or less since the device of would perform perfectly well with any acute angle, the particular difference of 3 degrees between adjacent parts is a matter of design choice. The amount of the angle provides the predictable result of limiting of movement within the shaft and one of ordinary skill in the art would design the bearing with the appropriate angle to limit the range of movement based on the application of the bearing.

Regarding claim 10, Harris discloses an oil-impregnated sintered bearing which includes a bearing body (50/52) made of a sintered metal to support a rotating shaft (see column 4 lines 24-28 and column 5 lines 45-59), the bearing body (52) having a bearing hole (central opening) formed therein, the bearing hole including a journal part (52b) of which an inner surface acting as a friction surface has a constant diameter, said journal part being configured to support the rotating shaft when the shaft is parallel to an axial direction of the bearing body, and enlarged diameter parts (52a) that are formed in a tapered shape (see Figure 3b) having diameters that are enlarged toward the tips thereof, wherein the bearing hole that includes the journal part (52b) having a constant diameter is formed by pressing (see Figures 1a-1d) an inner circumferential surface of a cylindrical sintered body completely sintered; the enlarged diameter parts (52a) that are connected with the journal part are formed by re-pressing (additional coining/pressing process, see column 5 lines 23-44) the inner circumferential surface of the cylindrical sintered body, the sintered density of the enlarged diameter parts is larger than that of the journal part such that cavities (pores) exposed on an inner surface of the enlarged

diameter part are smaller in size and fewer in number (52a is disclosed as having greater density and lower permeability, see column 5 lines 23-44, smaller and fewer pores results in a greater density and lower permeability) than those cavities exposed on an inner surface of the journal part (52b is disclosed as having a lower density and greater permeability, see column 5 lines 23-44, larger and a greater number of pores results in a lower density and greater permeability), each of the enlarged diameter parts includes a first part connected with an end of the journal part (transition between axial surface and tapered surface). It is also noted that Harris discloses the same pressing steps used to form the bearing as in the instant application including coining/pressing the ends of the blank, see column 5 lines 23-44, since Harris uses the same/similar method the resulting structure will have the ends of the bearing having a smaller pore size and fewer pores.

Harris does not disclose that said enlarged diameter parts are configured to support the rotating shaft when the shaft inclines with respect to the axial direction of the bearing body; a line obliquely extending along an inclined surface of one of the first parts is arranged parallel to a line obliquely extending along an inclined surface of the other first part, and a distance between the lines is substantially equal to the diameter of the rotating shaft.

Tanaka teaches a bearing having a journal part (32) and enlarged diameter parts (33), wherein the enlarged diameter parts are configured to support the rotating shaft when the shaft inclines with respect to the axial direction of the bearing body (see column 4, lines 44-48), a line obliquely extending along an inclined surface of a first part

(first taper from the main journal part 32) is arranged parallel to a line obliquely extending along an inclined surface of another first part on the other side of the journal part, and a distance between the lines is substantially equal to the diameter of the rotating shaft (paragraphs 0040-0042, surfaces 33 are sized to support the shaft even when inclined), for the purpose of sizing the enlarged diameters of the bearing so that they can support the shaft when the shaft is inclined relative to the axis of the bearing to increase the lifetime of the bearing (column 4 lines 37-48).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Harris and provide each of said enlarged diameter parts to be configured to support the rotating shaft when the shaft inclines with respect to the axial direction of the bearing body; a line obliquely extending along an inclined surface of one of the first parts is arranged parallel to a line obliquely extending along an inclined surface of the other first part, and a distance between the lines is substantially equal to the diameter of the rotating shaft, as taught by Tanaka, for the purpose of providing a bearing that can support a shaft when the shaft is inclined relative to the axis of the bearing to increase the lifetime of the bearing.

Regarding claims 18 and 19, these claims are reciting the method step in how the bearing is made. However, limitations regarding how a device is made in an apparatus claim are product-by-process limitations that, in this case, do not further structurally define the apparatus, see MPEP 2113. Also, as noted above, Harris discloses a similar multiple step pressing method in order to make the bearing.

Claims 11-13, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harris, USP 3,445,148, in view of Teruo, JP064-030922.

Regarding claims 11 and 20, Harris discloses an oil-impregnated sintered bearing comprising: a bearing body (blank 50, finished product 52) made of a sintered metal (see column 4 lines 24-28) to support a rotating shaft by an inner surface thereof as a friction surface (column 5 lines 45-59 discloses that a shaft is supported by the bearing), said bearing body (52) having a bearing hole (central opening) therein; wherein the bearing hole includes a journal part (52b) that has a constant diameter, said journal part being configured to support the rotating shaft when the shaft is parallel to an axial direction of the bearing body, enlarged diameter parts (at 52a) that are provided on both sides of the journal part (see Figure 3B) in the axial direction of the bearing body so as to be connected with the journal part; the sintered density of the enlarged diameter parts is larger than that of the journal part such that cavities (pores) exposed on an inner surface of the enlarged diameter part are smaller in size and fewer in number (52a is disclosed as having greater density and lower permeability, see column 5 lines 23-44, smaller and fewer pores results in a greater density and lower permeability) than those cavities exposed on an inner surface of the journal part (52b is disclosed as having a lower density and greater permeability, see column 5 lines 23-44, larger and a greater number of pores results in a lower density and greater permeability). It is also noted that Harris discloses the same pressing steps used to form the bearing as in the instant application including coining/pressing the ends of the blank

, see column 5 lines 23-44, since Harris uses the same/similar method the resulting structure will have the ends of the bearing having a smaller pore size and fewer pores. With regards to the limitation “wherein the journal part is formed first by pressing...with the respect to the journal part” and claim 20, these limitations are reciting the method steps in how the bearing is made, limitations regarding how a device is made in an apparatus claim are product-by-process limitations that, in this case, do not further structurally define the apparatus, see MPEP 2113. Also, as noted above, Harris discloses a similar multiple step pressing method in order to make the bearing.

Harris does not disclose that the enlarged diameter part is only on one side of the journal part and a chamfered portion is provided on the other side of the journal part, said enlarged diameter part being configured to support the rotating shaft when the shaft inclines with respect to the axial direction of the bearing body

Teruo teaches that a bearing (1, see Figure 1) configuration can comprise a shape that has a journal part (3a) of constant diameter, an enlarged diameter part (3b) that is only on one side of the journal part, and a chamfered portion (3a) provided on the other side of the journal part.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Harris and use shape that has the enlarged diameter part only on one side of the journal part and a chamfered portion provided on the other side of the journal part, as taught by Teruo, since altering and/or substituting the shape of the bearing based on the desired environment of use for the bearing yields the

predictable result of rotatably supporting a shaft in a housing. Also, a person with ordinary skill in the art has good reason to pursue the known options (disclosed bearing shapes) within his or her technical grasp, the changing of a bearings shape is a known option which has a finite number of possible arrangements, no taper, one taper, two tapers, steps, one chamfer or two chamfers, all these shapes where known at the time of filing and it would have been obvious to try the shapes with the sintered compact disclosed in Harris.

The combination above discloses a bearing with the same shape as claimed in and disclosed in the instant application. The same shape is capable of supporting a shaft when the shaft inclines with respect to the axial direction of the bearing body.

Regarding claims 12 and 17, Teruo discloses that the journal part (3a) and the enlarged diameter part (3b) are formed so that a distance between a line obliquely extending along an inclined surface of the enlarged diameter part toward the center of the bearing body and an inner wall surface of the journal part is substantially equal to and/or slightly larger than a diameter of the rotating shaft (at the intersecting point of 3b and 3a, to the right of 3a and the left of 3b the diameter is slightly larger than the diameter of the shaft, a "slightly larger" configuration also meets the limitation "substantially equal" since the specification does not clear define a bounds for the terms "slightly" or "substantially").

Regarding claim 13, Harris in view of Teruo also does not teach a taper angle between an inclined plane of the enlarged diameter part and an inner surface of the journal part parallel to the axial direction of the bearing body is set to 3° or less.

Since the applicant is silent to any criticality or unexpected results from having the angle set at 3 degrees or less it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Harris and provide an angle of 3 degrees or less since the device would perform perfectly well with any acute angle, the particular angle of 3 degrees is a matter of design choice. The amount of the angle provides the predictable result of limiting of movement within the shaft and one of ordinary skill in the art would design the bearing with the appropriate angle to limit the range of movement based on the application of the bearing.

Response to Arguments

Applicant's arguments filed July 5, 2011 have been fully considered but they are not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant argues that Harris does not show tapered surfaces that perform the newly added function of supporting the shaft, however, the details of the tapered surface were taught in the previous action, and this action, by Tanaka.

The Applicant argues that Harris does not disclose a clear border between the high and low density portions and therefore the density of 52a is not always larger than 52b.

First the claim does not set forth that there is a clear border between the two regions, so there, in fact, could be a mixing of the regions. Second, the resulting combination of Harris, which has a bearing with a middle region of one density and ends of a second density that, when combined with the bearing shape of Tanaka, meets the geometry and density requirements of the claim.

Applicant argues that because how the device is formed, accurately and the steps used in the method of making, the device of Harris does not meet the limitations of the claims.

As noted above, the newly added language to the claim of how the bearing is made is a product-by-process limitation that does not define or limit the claim to any particular structure. Since the resulting combination, regardless of the steps used in making the bearing, has a middle region of one density and two end regions of a second density with a taper that can support an inclined shaft the structural limitations of the claim are met and the claims are rejected. See MPEP 2113.

Applicant's argues that the oblique lines of Tanaka are not necessary parallel and the spacing between the lines is not necessary "substantially equal" to the width of the shaft.

Tanaka states in paragraph 0042 that "Even if a shaft inserted into the bearing is inclined relative to the axis of the bearing, the shaft can be properly supported by one of the end surfaces 33, thereby increasing the lifetime of the bearing." In order to "properly support" the shaft the tapered surfaces must be parallel and "substantially equal to the diameter of the rotating shaft." The drawings in Tanaka, specifically Figure 10, show that the bearing is symmetrical across both the horizontal axis and vertical axis, since the bearing is symmetrical lines extending from the opposite end surfaces 33 are parallel. The drawings in combination with the disclosure in paragraph 0042 does indeed disclose, or at the very least suggests, a configuration that allows the shaft to be inclined to the point that it is supported by surfaces 33 and not 32, if this is not the case then the bearing of Tanaka would not provide the disclosed benefit of extending the life of the bearing since the shaft when inclined would run on at least part of the surface of the bearing. It is also noted that the bearing in Tanaka has the same shape as the bearing shown in Figure 1 of the instant application.

It is noted that Applicant argues independent claim 11 with claims 1 and 10, however claim 11 relies on a combination of Harris and Teruo [Shimizu] which is different from claims 1 and 10 which relies on a combination of Harris and Tanaka. Since the grounds of rejection are not the same and Applicant does not point to any

deficiencies that are believed to be in the Teruo document the rejection of Harris in view of Teruo stands. Also, similarly to the Tanaka document, Teruo also shows a shape of the bearing in Figure 1 that is similar to shape being claimed in claim 11 and shown in Figure 11 of the instant application

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES PILKINGTON whose telephone number is (571)272-5052. The examiner can normally be reached on Monday - Friday 7-3.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on (571)272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 3656
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